output of said rectifier means (32) and an output, said power factor correction converter means (38) being responsive to said rectified d.c. power at said power factor correction converter means input for generating regulated voltage d.c. power at said power factor correction converter means output; and

an LED array **(12)**, defined as consisting of series-parallel connected LED devices, having an input connected to said output of said power factor correction converter means **(38)** for receiving said regulated voltage d.c. power to illuminate said LED array **(12)**.

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5. (Amended) An apparatus for supplying regulated voltage d.c. electrical power to an LED array comprising:

a rectifier means **(32)** having an input and an output, said rectifier means **(32)** being responsive to a.c. power at said input for generating rectified d.c. power at said output;

a power factor correction converter means **(38)** having an input connected to said output of said rectifier means **(32)** and an output, said power factor correction converter means **(38)** being responsive to said rectified d.c. power at said power factor correction converter means input for generating regulated voltage d.c. power at said power factor correction converter means output;

an LED array **(12)** having an input connected to said output of said power factor correction converter means **(38)** for receiving said regulated voltage d.c. power to illuminate said LED array **(12)**; and

[The apparatus according to claim 1 including] an adaptive clamp circuit means **(24)** connected to said input of said rectifier means **(32)** for eliminating leakage current problems.

6. (Amended) An apparatus for supplying regulated voltage d.c. electrical power to an LED array comprising:

a rectifier means (32) having an input and an output, said rectifier means (32) being responsive to a.c. power at said input for generating rectified d.c. power at said output;

a power factor correction converter means (38) having an input connected to said output of said rectifier means (32) and an output, said power factor correction converter means (38) being responsive to said rectified d.c. power at said power factor correction converter means input for generating regulated voltage d.c. power at said power factor correction converter means output;

an LED array (12) having an input connected to said output of said power factor correction converter means (38) for receiving said regulated voltage d.c. power to illuminate said LED array (12); and

an adaptive clamp circuit means (24) connected to said input of said rectifier means (32) for eliminating leakage current problems. [The apparatus according to claim 5] wherein said adaptive clamp circuit means (24) has an input adapted to be connected to a pair of a.c. power lines (22), a pair of clamp circuit output lines (26) connected to said adaptive clamp circuit means input, a voltage sensing means (48) connected across said input of said adaptive clamp circuit means (24), and a controlled load means (50) connected across said clamp circuit output lines (26) and to said voltage sensing means (48), said voltage sensing means (48) being responsive to a magnitude of a.c. voltage at said adaptive clamp circuit means input lower than a predetermined magnitude for turning on said controlled load means (50) to connect a low impedance load (60) in said controlled load means (50) across said clamp circuit output lines (26) and said voltage sensing means (48) being responsive to a magnitude of the a.c. voltage at said adaptive clamp circuit means input equal to or greater than said predetermined magnitude for turning off said controlled load means (50) to disconnect said low impedance load (60) from said clamp circuit output lines (26).

24. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output; [and]

a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light[.];

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an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

25. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output; [and]

a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

26. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output; [and]

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an LED array having an input connected to the output of the power supply[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

27. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output; [and]

a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

28. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; [and]

a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

29. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; [and]

a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the

electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

30. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; [and]

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a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

31. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage; [and]

an LED array having an input connected to the output of the power supply[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

32. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase; [and]

a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

33. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially

constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase; [and]

a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

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34. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase; [and]

a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

35. (Amended) A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

an electrical input for coupling to a source of a.c. line voltage;

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a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase; [and]

an LED array having an input connected to the output of the power supply[.];

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

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45. (Amended) An apparatus for supplying power to an LED array in an outdoor line-connected signal comprising:

a rectifier **(32)** having an input and an output, said rectifier **(32)** being responsive to power at said input for generating rectified power at said output;

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a power factor correction converter **(38)** having an input connected to said output of said rectifier **(32)** and an output, said power factor correction converter **(38)** being responsive to said rectified power at said power factor correction converter input for generating one of constant current and constant voltage at said power factor correction converter output; [and]

an LED array **(12)** having an input connected to said output of said power factor correction converter **(38)** for receiving said one of said constant current and constant voltage to illuminate said LED array **(12)**[.];

an electromagnetic interference filter means coupled to the power factor